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M36C
1888-1889

BI-ENNIAL REPORT
MARYLAND
AGRICULTURAL COLLEGE
1888-1889.

Maryland University

REPORT

—OF THE—

BOARD OF TRUSTEES

—OF THE—

Maryland Agricultural College

—AND—

✱EXPERIMENT STATION,✱

—TO THE—

GENERAL ASSEMBLY,

—FOR THE YEARS—

1888—1889.

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MARYLAND AGRICULTURAL COLLEGE.

BOARD OF TRUSTEES,

1888--1889.

Members Ex-Officio, under State Law:

HIS EXCELLENCY E. E. JACKSON, Governor,
President of the Board.

HON. GEORGE PETER, *President of the Senate.*
HON. GEORGE M. UPSHUR, *Speaker of the House of Delegates.*
HON. WILLIAM PINKNEY WHITE, *Attorney General.*
HON. L. VICTOR BAUGHMAN, *Comptroller of the Treasury.*
HON. STEVENSON ARCHER, *State Treasurer.*
*HON. NORMAN J. COLMAN, *U. S. Com'r of Agriculture.*

Members Elected by the Stockholders:

HON. J. CARROLL WALSH, Jerusalem Mills, Harford Co.
HON. WILMOT JOHNSON, Catonsville, Baltimore Co.
CHAS. B. CALVERT, Esq., Agricultural College, P. G. Co.
ROBERT A. DOBBIN, Esq., St. Denis, Baltimore Co.
ALLEN DODGE, Esq., Washington, D. C.

Members by Executive Appointment:

	<i>Terms Expire.</i>
COL. F. CARROLL GOLDSBOROUGH, Easton, Talbot Co.	1894
DAVID SEIBERT, Esq., Clear Spring, Washington Co.	1894
GEORGE R. WILLIS, Esq., 213 Courtland St., Balto.	1892
DR. CHARLES A. WELLS, Hyattsville, P. G. Co.	1892
JEREMIAH P. SILVER, Esq., Glenville, Harford Co.	1890
†DR. A. P. SHARP, Rock Hall, Kent Co.	1890

*Vacant. Office expired by Constitutional limitation, Feb. 1889.

†Resigned.

[Letter of Transmittal.]

AGRICULTURAL COLLEGE,
PRINCE GEORGE'S COUNTY, MARYLAND,

January 20th, 1890.

To the Honorable,

*The Speaker of the House of Delegates,
Annapolis, Md.*

SIR:—On behalf of the Board of Trustees, and as authorized by its Executive Committee, I have the honor to transmit herewith the reports required by law at this time, from the Maryland Agricultural College and Experiment Station.

Very respectfully,

GEO. R. WILLIS,

Chairman Executive Committee.

48372

*Extracts from the Laws relating to reports to be rendered by
the Maryland Agricultural College and
Experiment Station.*

(Maryland Laws of 1856, chapter 97, sec. 7.)

By the College Charter, the Board of Trustees is required to present to every Session of the State Legislature, a "full and correct report of the condition of the said Agricultural College and Model Farm, and the condition or final results of all experiments undertaken."

* * * *

(Maryland Laws of 1865, chapter 178, sec. 1.)

This Act assigns to the Maryland Agricultural College, the benefits of the Congressional Land-Grant of 1862, and provides as follows: "and the said College shall, in all respects, comply with the several requirements of the said Act, as to making and recording experiments and reporting the same."

* * * *

(United States Revised Statutes, Vol. 12, chapter 130.)

The Act of Congress of 1862, last mentioned above, requires: "An annual report to be made regarding the progress of each College, recording any improvements and experiments made, with their cost and results."

* * * *

(U. S. Revised Statutes, Vol. 24, chapter 314, p. 440.)

The Act establishing Experiment Stations, approved March 2, 1887, contains the following in section 3: "It shall be the duty of each of the said Stations, annually, on or before the first day of February, to make to the Governor of the State or Territory in which it is located, a full and detailed report of its operations."

* * * *

(Maryland Laws of 1888, chapter 55, sec. 2.)

By this Act the State of Maryland assents to the above cited Act of Congress "to establish agricultural experiment stations in connection with the agricultural colleges,"—"upon the terms and in accordance with the several conditions and provisions of said Act contained."

REPORT TO THE GENERAL ASSEMBLY

FROM THE

—*Maryland Agricultural College*

FOR THE YEARS 1888 AND 1889.

The last Report of the Board of Trustees of the Maryland Agricultural College to the General Assembly of the State, was made by the Acting President, and dated January 10, 1888. Since that time, material changes have been made by State legislation in the organization and scope of this institution. By chapter 55, of the Laws of 1888, the assent of the State was given to an Act of Congress "to establish agricultural experiment stations," and the Maryland Agricultural College was designated as the place for such station in this State. This adds the broad field of agricultural investigation to that of instruction, greatly extending the work of the institution and fully doubling its annual income. And by chapter 326, of the Laws of 1888, the corporation of the College was re-organized and the Board of Trustees enlarged, by adding "one person from each of the Congressional districts of the State, who shall be a practical farmer, or immediately interested in agricultural pursuits, who shall be appointed by the Governor, by and with the consent of the Senate, for the term of six years."

In accordance with existing laws, as per extracts printed on a preceding page, the present report will include "a full and correct report of the condition, progress and improvements of the College" for the calendar years of 1888 and 1889, and of its financial affairs, and "a full and detailed report of the operations" of the Agricultural Experiment Station for the year 1889. The annual report of the Station for 1888

having been rendered to the Governor of the State in January, 1889, as required by law, and subsequently published and distributed in limited number at the expense of the Station itself, will not be included in this report.

The first recommendation of the Board is, that the General Assembly should authorize the publication of this entire Report, and the distribution of a moderate edition thereof, that the residents and tax-payers of the State may be informed of the condition and advantages of this educational institution, which is freely provided for the people, and the distribution of a larger edition of the portion relating to the Experiment Station, printed by itself, that all interested in the practical agricultural affairs of the State may be made acquainted with the operations of this new institution, created and maintained for their special benefit without expense to the State. And it is further recommended that at the present session of the General Assembly, similar provision be made for the publication of the Annual Report of the Agricultural Experiment Station for the year 1890, which is required by law, agreed to by the State, to be rendered to the Governor during the month of January, 1891.

At the beginning of the year 1888, the general management of the affairs of the College was vested by the Board in its Executive Committee of three members, one of whom was Acting President and another Acting Treasurer, and the immediate control of the College proper was delegated to one of the resident professors, as chairman of the faculty. The first quarterly meeting of the Board of Trustees for 1888, was held at the College on the 9th of March, and the following appears in the record of that meeting, as unanimously adopted:

“WHEREAS, The Legislature of Maryland has designated the Maryland Agricultural College as an Experiment Station, under the provisions of the Act of Congress, approved July 2, 1862, and its supplements, and also the Act of Congress, approved March 2, 1887, (generally known as the

"Hatch Bill,") and the Trustees of said College being desirous of formally accepting said designation; therefore, be it

"Resolved, That the said Maryland Agricultural College, by its Trustees, do hereby signify their acceptance of said designation of this College by the Maryland Legislature, under the Act of 1888, and also their intention to comply with all Acts of Congress creating and governing experiment stations, and do hereby establish an experiment station in connection with the College, under the provisions of said laws.

"Resolved, That an office is established to be known and designated as Director of the Maryland Agricultural Experiment Station."

At the same meeting the Board elected as President of the College and Director of the Experiment Station, Henry E. Alvord, C. E., then Professor of Agriculture at the Massachusetts Agricultural College. From 1881 to 1886, inclusive, this gentleman was the General Manager of Houghton Farm, a well-known Experiment farm or "Station," then supported by private means, after the plan of the famous "Rothamsted" of Sir John Lawes, near Salisbury, England. Major Alvord accepted and entered upon his duties at the College on the 1st of April.

On the 16th of May, a special meeting of the Trustees was called, and being attended by the members newly appointed (under chapter 326, Laws of 1888,) the organization of the Board was effected as now constituted. (See p.—) Standing committees were appointed on Agriculture, Education and Finance, with an Auditing Committee and an Executive Committee. The chairmen of the standing committees named, and the auditors, are members of the Executive Committee. Two changes have since occurred in the membership of the Board; the office of U. S. Commissioner of Agriculture has ceased to exist, and Dr. A. P. Sharp, executive appointee from the 4th Congressional District, has resigned.

The re-organized Board gave its immediate attention to ascertaining the condition and needs of the property of the College, (and State,) and to the outstanding obligations,

unsettled accounts and general business interests of the institution.

THE PROPERTY.

Of the estate of 428 acres originally purchased, the College now holds 286 acres, which is land enough, and more. The buildings include the main College of brick, a detached brick structure used as chemical laboratory, a frame gymnasium, the President's dwelling, (frame) a set of cheap and plain farm and storage buildings, a small foreman's cottage and "Rossburg," the only building on the place when bought for the College. The latter, situated directly on the old Baltimore and Washington Turnpike, which crosses the estate, and the land in the immediate vicinity of this building is assigned to the use of the Experiment Station.

The main College building is a substantial structure five stories high and in a good state of general preservation. But it has been in use for thirty years, by almost as many successive sets of boys and young men, with comparatively little expenditure for repairs. The time has now come when floors and stairs, actually worn out by constant service, and doors and window sills which have seen long and sometimes hard usage, need to be wholly replaced. In the Spring of 1888, the roof was found to be leaking badly, the kitchen range was worn out, the heating apparatus was inefficient, the plumbing was in a dangerous condition, and the drains and sewers were obstructed. Work seemed to be needed at every point. And what was true of the main building, applied to a greater or less degree to all the others.

Where so much was needed for the preservation and improvement of property, it was hard to tell how to begin. During the summer of 1888 a careful inspection was made to determine what repairs must receive first attention, and these were then executed as expeditiously and economically as consistent with substantial work. The Board made an appropriation of \$2500 for repairs, under the supervision of the Finance Committee and the Treasurer's Report shows

that the sum of \$2,467.36 was expended. This was confined to the main college and adjacent out-buildings and met all emergencies. Fortunately, the assignment of the Rossburg building to the use of the Experiment Station, provided for its much needed renovation, without direct expense to the College. The Board in 1889 made a further appropriation of \$1,400 for repairs and improvements and this has been largely expended, although not covered by the accompanying Finance Report. The recent repairs include pointing and partially painting the exterior of the main college building, and some wood-work and painting on the interior. To add to the appearance and preservation of this building and make all the students' rooms equally comfortable and attractive, a good deal more should be done, in this same line of repairs.

The chemical laboratory, built and formerly used as a laundry, is becoming crowded, and needs extension and renovation. In this the important chemical work is done connected with the State Law relating to commercial fertilizers, and this, for accuracy and value, requires plenty of room and special accommodations.

The old gymnasium building is dismantled and dilapidated. No funds have been available for expenditure upon it, yet the building ought to be thoroughly repaired and refitted, and if made comfortable in all weather, it would contribute much to the health, pleasure and general well-being of the students. This is the only place for the recreation of the students in inclement weather, and in its present condition is almost useless.

Three separate steam-boilers are now the chief means for warming the College building, although a few stoves are still necessary. These boilers are kept in good order and properly inspected, periodically, but they are placed in the basements of inhabited buildings and furnish unnecessary anxiety and risk of injury to persons and property, besides being comparatively expensive in the items of care and fuel. A central steam-plant for the whole establishment, with a

single fire, safely located and connected with the existing system of pipes, would be a vast improvement and ensure safety and economy. The conformation of the College grounds and arrangement of buildings especially favors such a plan.

The farm and other out-buildings, fences, roads, drains and the land itself, all need early attention and expenditure. Part of this will be specially mentioned in connection with the College farm.

A considerable tract of land, lying directly between the College property and the College Station on the Baltimore and Ohio Railroad, but unimproved and very unsightly, has for some years given an extremely unfavorable impression when approaching the College. This land has lately changed owners and been sub-divided, laid out in streets and village lots and opened to the public. The roads have been graded and the tract drained. The property is called "College Park," and a broad avenue is opened from near the depot directly to the main gate of the College grounds. The public route, between College and railroad is thus reduced nearly one-half in length, and greatly improved in kind and appearance. This piece of private enterprise is unquestionably of direct benefit to the College and its property, in several ways. The Board has authorized moderate assistance in improving the new "College Avenue," and provided for a temporary plank-walk from the College gate to the railroad station. The number of people visiting the College and Experiment Station is now steadily increasing, individuals and delegates from different agricultural organizations come almost every week, the distance from the depot is a full mile, nearly all must walk, and it seems only proper that the State should provide comfortable access to these public institutions in the form of suitable sidewalks.

Regarding it to be their duty as Trustees to keep this entire property in a condition of substantial repair, and to make manifestly needed improvements, as would be done by a careful private owner, as the tax-payers desire the public

property to be managed, and as becoming a State Institution and the State maintaining it, the Board believes the General Assembly should provide the necessary means.

The following specific appropriations are recommended to be made by the Legislature of 1890, viz :

1. For renovating and repairing the main College building.....	\$2,500 00
2. For addition and repairs to the chemical laboratory	2,000 00
3. For repair and refitting of the gymnasium.....	800 00
4. For a central steam-plant, fittings and connections..	4,500 00
5. For repairs and improvements of roads, fences, drains and grounds.....	1,000 00
6. For connecting College, Station and Railroad, with side-walks.....	700 00

Total for the improvement and repair of the property.....	\$11,500 00
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All of the work described is greatly needed and it can only be done by funds specially granted by the General Assembly.

INSURANCE.

During the year 1889, the insurance upon the College property of all kinds, against loss by fire, has been re-adjusted and a single carefully prepared policy for fifty thousand dollars has been placed, at very advantageous rates, the risk being divided between ten responsible companies, approved by the State Insurance Commissioner.

THE FINANCES.

The last Treasurer's Report from the College, presented to the Legislature, was dated January 3, 1888, and showed a balance of cash then remaining on hand of \$125.59. For the next six months, complete accounts were not kept at the College, and no analytical statement of its finances can be rendered for that period. But the check-book and cash-book are on file and show that the total cash receipts from January 3, to June 30, 1888, including balances, were \$10,279.18 and the disbursements on all accounts, for same

time, \$9,630.81, leaving a balance on June 30th, 1888, of \$648.37.

The Board ordered that beginning July 1st, 1888, the resident Registrar and Treasurer should give bond, and thereafter be the sole financial agent of the corporation, in accordance with its By-laws, keeping a full set of books of account. Later, the fiscal year of the College was ordered to be closed the 31st day of August, beginning with 1889. Accordingly, the College Treasurer's Report which accompanies this and will be found at later a page, covers a period of fourteen months, from July 1st, 1888, to August 31st, 1889, inclusive, and this includes one full collegiate year and parts of two summer vacations. This report, therefore, cannot show the annual financial affairs of the College as well as will be the case hereafter. Some analytical statements are accordingly presented.

The fiscal year for the Experiment Station necessarily conforms to that of the United States Treasury, from which its whole income is derived and to which reports have to be made. The first annual financial statement of the Experiment Station, for the year ending June 30th, 1888, was published in the First Annual Report of the Station, and the similar statement of the Treasurer, for the year ending June 30th, 1889, is hereunto attached.

[In accordance with its charter, and regularly from its establishment, the College received an annual donation of six thousand dollars from the State. This was continued, uninterruptedly, for twenty-five years and then was withdrawn for five years, beginning October 1st, 1883. As a result of this loss of the State support, the College became involved in debt and when the Board made a careful compilation of its various liabilities, at the end of June, 1888, preparatory to opening its new financial records, the following resulted:

COLLEGE DEBT, JUNE 30, 1888.

Secured. Discounted notes secured by pledge of future income	\$6,000 00
Unsecured. 21 Negotiable notes from \$51.00 to \$1,250.00 mostly discounted	5,209 38
Unsecured. 35 Open accounts balances due \$16.00 to \$1,928.00.....	7,694 55
Claims. Unadjusted. Subsequently allowed at.....	772 52
Total indebtedness.....	\$19,676 45

Against this total, there was cash in hand amounting to \$648.37, which left a net indebtedness just rising *nineteen thousand dollars*. There seems at first a great discrepancy between this sum and the amount of debt in January, 1888, as stated in the last report to the General Assembly, but in reality none such exists. The Acting Treasurer did not include the secured debts of the College, although in the form of notes discounted at the bank, with drafts on the State officers for future income, when due, given as collateral. And a number of claims of some years' standing, not then on record with the College officers, and unknown to them, were later presented, investigated and allowed. These additions being made, the two Reports on the debt made in January and June, 1888, substantially agree. This was the inheritance of the present College administration and it has proved a heavy load to carry, while attempting to make some progress with the institution.

This debt was in a most perplexing and annoying form. Almost every day a note matured in Baltimore or Washington, and some arrangement had to be made for its renewal, with possibly a slight reduction. The creditors were clamorous and persistent, in some cases being quite out of patience. A few suits had been instituted and College property was actually advertised at Sheriff's sale. To the debt attention had to be at once given and under authority of the Board, supervised by the Finance Committee, the executive officers of the College succeeded in effecting a very substantial reduction and re-adjustment in the course of

fourteen months, as shown by the following comparative statement:

STATEMENT OF THE COLLEGE DEBT.

Form.	June 30, 1888.	Aug. 31, 1889.
Secured. Anticipated income....	\$6,000 00	\$4,500 00
Negotiable notes,(21)	5,209 38	(6) 3,200 00
Certificate of indebtedness, ..(0)	0 00	(7) 5,300 00
Open accounts,(35)	7,694 55	(2) 500 00
Unadjusted claims	772 52	0 00
Totals.....	\$19,676 45	\$13,500 00

The net reduction of the debt during the period named was \$6,176.45, or over thirty-one per cent.

This has only been accomplished by keeping the expenses of conducting the College at the lowest possible point, and devoting all of the State donation to debt reduction, necessary repairs and cost of general administration. Had it not been for this debt, requiring most of the State donation of the past two years, the Board might have applied that largely to those objects for which special appropriations are now necessary. The item of interest and discount amounts to nearly seven hundred dollars, and this must continue a serious burden until the debt is paid.

It does not seem wise for a State institution, a large part of whose invested funds are yielding only three per centum, to be carrying a floating debt of several thousand dollars at six per cent. interest, generally payable in advance, nor to prevent the natural growth and development of such an institution by the hampering influence of an old debt. And it is certainly unfair to the present generation of students, invited to all the benefits of the College, to have a full half of its current income, diverted from channels useful to them and applied to rapidly pay off a debt which is the accumulation of years.

The Board recommends as the remedy at once simple, wise and just, that the General Assembly at its present Session should make a special appropriation of \$13,500.00 to free this State College from debt, sever it from its past mis-

fortunes and give it a fresh start. This being done, the way is at once open to growth, prosperity and public usefulness on an enlarged scale, and the present Board pledges itself in such case, to see that the College is conducted, as it has been during the last two years, strictly within its known income.

The Experiment Station is wholly supported by annual appropriation from the Treasury of the United States, and is conducted within its fixed income of fifteen thousand dollars. Under the Law, the finances of this department of the institution must be kept quite distinct. While the Station costs the College nothing, the latter in many ways indirectly derives aid and benefit from the Station.

The business affairs of the College may be considered in three general groups:

A. The income from students and from professors, their families, and others boarding at the College, constitutes a fund for the support of the Domestic Department. Against this is charged all the household expenses, supplies, labor, fuel, laundry, the books and stationery and any rebates, refunds or special expenses on account of students. A small balance in favor of the College is expected.

B. The income from the Land-Scrip Fund, the Federal endowment of the College, held in trust by the State, and from fees under the Commercial Fertilizer Law, constitutes a fund for the support of the Department of Instruction and Equipment. Against this is charged all salaries to professors and lecturers, and for the support of the chemical laboratory, and for equipment, appliances and other facilities for instruction.

C. The State donation, or annual appropriation, is held for the Department of Administration, or the general maintenance fund. Against this is charged interest, insurance, taxes, advertising, all repairs and improvements on the buildings on the College Farm, general incidental expenses and at present, all payments on the debt.)

To show the relation of these different departments and

the result of their management, as described, during the period covered by the present financial report, the following statement has been prepared, the figures being taken from the College ledger, on the 31st of August, 1889.

A. DOMESTIC DEPARTMENT.

DEBITS.

From students	\$5,687 61
From boarders, &c	2,435 57
Total	<u>\$8,123 18</u>

CREDITS.

Domestic Department	\$5,580 42
Labor	425 00
Fuel	663 14
Laundry	369 30
Books, &c	366 46
Refunded students	190 11
Total	<u>\$7,594 43</u>
Excess or gain	528 75
	<u><u>\$8,123 18</u></u>

B. DEPARTMENT OF INSTRUCTION.

DEBITS.

From Land Scrip income	\$9,071 15
From fees, Fertilizer Law	1,466 00
Total	<u>\$10,537 15</u>

CREDITS.

Salaries	\$5,749 73
Equipment	516 07
Total	<u>\$6,265 80</u>
Excess	4,271 35
	<u><u>\$10,537 15</u></u>

This great excess results from 18 months receipts and only 12 months expenses, during period covered by this report.

C. DEPARTMENT OF ADMINISTRATION.

DEBITS.

State Donation	\$6,025 00
Collected, old accounts	702 40
Interest and discount	34 93
Total	<u>\$6,762 33</u>
Deficit	3,635 86
	<u><u>\$10,398 19</u></u>

CREDITS.

Old accounts, (debt)	\$5,177 45
Repairs	2,467 36
Interest	687 70
General expenses	1,278 20
Advertising, insurance, &c	594 96
Farm—net cost	192 52
Total	<u>\$10,398 19</u>

From this table it is seen that the Domestic Department and the Department of Instruction and Equipment are not only conducted without expense to the State, but under present management they yield small balances toward defraying the general running expenses of the institution. The College necessarily depends upon the annual State donation of six thousand dollars, to meet the general expenses of administration, keep the property in repair, pay insurance and taxes, make all needful improvements and at present, care for the interest and principal of the debt.

This annual appropriation is, therefore, essential to the life and prosperity of the institution, and when the College is free from debt a large share of this donation can be annually applied to those additions and betterments which every progressive institution requires and which are needed in this case to make the Maryland Agricultural College worthy of its place among the higher educational establishments of the State.

In order to make the benefits of the institution available to as many as possible, the Board has declared tuition and room rent absolutely free to all and reduced the actual living expenses to the lowest point consistent with health and comfort. In June, 1888, the total charge to students for the academic year was reduced to \$185, an addition of \$60 being made to non-residents of the State. In June, 1889, the rate was still further reduced to \$165, and all restrictions as to residence removed. The College is therefore now free to all who are fitted for its work, the receipts from students being merely sufficient to defray their actual liv-

ing expenses while in attendance. It is safe to say that no educational institution of like grade in this State, or in the neighboring States, offers equal facilities at less cost to the student.

THE COLLEGE.

The present organization of the College proper and its course of instruction is made to conform as nearly as possible to the technical requirements of its original charter from the State, as somewhat modified by subsequent legislation in connection with the Congressional "Agricultural College Act" of 1862. The aims of the College are well expressed in the language of the law :

"Its leading object shall be, without excluding other "scientific and classical studies, and including military tactics, to teach such branches of learning as are related to "agriculture and the mechanic arts, * * in order to promote "the liberal and practical education of the industrial "classes in the several pursuits and professions in life."

Under a generous interpretation of this law the course of study now offered at the College, and which is arranged for completion in four years, is believed to be broad, liberal and practical. This will be better appreciated by an examination of the appended reports from the different departments of instruction, which describe the work of the several classes in some detail. Briefly reviewed, it is seen that instruction is given in agriculture and horticulture, theoretical and practical, throughout the course, with constant illustrations in the class-room, museums, laboratory and stable, on the farm and at the Experiment Station. In natural history the mineral, vegetable and animal kingdoms are studied ; climatology, geology, mineralogy, botany, zoology, with comparative anatomy and entomology, and the elements of veterinary practice. The chemical instruction is general and special, being made very full and thorough, with abundant laboratory practice, particular attention being given to agricultural analyses. In the department of physics the mechanical powers and the physical

forces of nature are taught, with the properties of matter, sound, light, heat, electricity, magnetism, and their economic applications ; these subjects are now fairly illustrated, although more apparatus is greatly needed. Particular attention is given to a full and continuous course in English, that all the other instruction of the student may be re-enforced and made doubly useful, by giving him a free and accurate power of using his mother tongue in speaking and writing ; this course embraces language lessons and literature, logic, rhetoric, elocution, and also general history, constitutional history, civil government and political economy. A special aim is to make the graduate acquainted with and appreciative of, the rights, privileges and duties of citizenship. Optional courses of study are offered in the German, French and Latin languages. In mathematics the usual college course is taught, but with special reference to practical application ; this includes every-day calculations, computations and measurements in ordinary business and country life, and also plane surveying, dividing lands, mapping, road-making, grading, draining, water-works and principles of building and construction. This line of work is accompanied by drawing, free-hand, geometrical and topographical. As required by law military drill occurs four days in the week, the weather permitting, and some theoretical instruction is given in tactics, field operations and military history.

[The faculty consists of the president and six resident instructors, four of whom occupy rooms in the college building. Special instructors have been employed as required, and the regular class work has been supplemented during the last two years by valuable courses of lectures by experts and specialists, well-known in their respective lines of investigation.] Notable among these lectures have been the following: On forestry and tree-planting by Dr. Eggleston, Secretary of the American Forestry Association ; on the practical aspects of physical geography and geology, by Prof. George P. Merrill, of the United States

National Museum; on the birds and mammals of America in their relations to agriculture, by Dr. C. Hart Merriam, of the Department of Agriculture; upon the principles of breeding domesticated animals, by Dr. M. G. Ellzey, of Earnscliffe Stock Farm, in Howard county, and on comparative anatomy and veterinary science and practice, by Dr. F. L. Kilborne, superintendent of the Experiment Station of the United States Bureau of Animal Industry.

The several class-rooms have been renovated and refurnished and to some extent supplied with those accessories which are so largely and effectively used by modern teachers. In certain lines of collections and appliances the college is fairly provided, but in others there are serious deficiencies, and several thousand dollars could be judiciously expended in these facilities for instruction which would be of every day use. The needs particularly felt at present are models and other equipment for the study of natural history, certain apparatus for the department of physics and books of reference for literary work.

The attendance of students at the College has been steadily, although slowly, increasing, and at the date of writing this report, is larger than at any time for two years. The following table shows the details in this particular:

ATTENDANCE OF STUDENTS IN JANUARY FOR THREE YEARS.			
CLASSES.	1888.	1889.	1890.
Senior.....	7	4	7
Junior.....	7	8.	10
Sophomore.....	13	12	15
Freshman.....	7	12	11
Total in College course.....	34	36	43
Preparatory	8	0	0

The preparatory class was discontinued in the Summer of 1888, as it was found to be incongruous, demoralizing and disproportionately expensive.

That the patrons of the College are satisfied with it, both students and parents, has been lately shown in a notable manner. Every student who finished the scholastic year

in June, 1889, returned in September last, except those graduated and two compelled by circumstances to leave college. No higher compliment could be paid to any institution and few of like grade anywhere, can furnish such a record.

Compared with similar institutions in other States and some which apparently offer much greater attractions to students, the attendance at the Maryland Agricultural College must be regarded as encouraging. A sub-committee of this Board has lately visited several flourishing Agricultural or "Land Grant" Colleges in neighboring States. Its report of observations presented to the Board is appended, and particular attention is invited to the "Notes on Colleges," from which the following is here appropriately quoted:

↑ "Maryland has more students pursuing the regular course at her Agricultural College than there are at the similar institutions in the great Keystone and Empire States, and compared with the investment, the Maryland College has more students than the Massachusetts College, while in Maryland students attend college at a much less cost, both public and private, than in Massachusetts, New York or Pennsylvania." ↓

As military instruction is required at this college as one of the main conditions of its federal endowment, the government of the United States has properly secured to the college, by law, the continuous service of some officer of the regular army, detailed for the purpose from time to time. This makes it convenient and desirable to apply the military system to the discipline of the students while in and about the building. And when deemed necessary this discipline is extended to apply to individuals, or to the entire body of students, at all times and places. The rooms occupied by students, as well as their clothing, arms and equipments, are regularly inspected, and neatness and order are enforced. Yet while this military feature is so administered as to honestly meet the requirements of law and to

benefit the college and individual students, it is not permitted to interfere with other educational interests and duties, or to encroach upon reasonable periods of recreation.

CHANGES IN THE FACULTY.

There have been a number of changes in the *personnel* of the Faculty of Instruction since the last report. The election of Major Alyord as President, in March, 1888, has already been noted. In June of that year, Professor J. B. Starr, a talented young graduate of the United States Naval Academy, relinquished the chair of mathematics and the position of commandant, which he had held for a year and resumed private teaching at Annapolis; he died there in October following. Professor Joseph F. James, M. Sc., late of Miami University, Ohio, was appointed to the newly-established department of natural history in September, 1888, and discharged the duties of that chair until February, 1889, when he resigned to accept a position in the service of the United States Geological Survey. On September 29, 1888, a War Department order detailed Second Lieutenant Albert B. Scott, Thirteenth Regiment Infantry, United States Army, as Professor of Military Science and Tactics at the College; this officer was then in Texas, but he joined for duty the next month and has since had charge of the Military Department and has, in addition, acted as professor of mathematics. The College sustained a very serious loss, in the death by drowning, of Professor Paul Combs, A. B., near his home at Leonardtown, St. Mary's County, December 27, 1888; Professor Combs was a graduate of the Western Maryland College, a young man of uncommon promise and a successful and much beloved instructor. Captain Julius B. Weems, B. S., a graduate of this College in 1888, was employed in January, 1889, as a temporary instructor and served until the close of the scholastic year, when he entered Johns Hopkins University to pursue higher scientific studies. In July, 1889, Professor John A. Chambliss, A. M., D. D., who had for four years held the chair of English Language and Lit-

erature and Latin, tendered his resignation to accept a call to return to the ministry. To this vacancy Professor Richard H. Alvey, junior, of Hagerstown, was elected and assumed charge of the department of language and literature in September last. At the same time, Professor Dice McLaren, M. S., B. D., lately a student of biology at John's Hopkins University, was chosen professor of natural history and at once entered upon his duties.

Frequent changes in a corps of college professors are objectionable for many reasons, and although some of the casualties named are exceptional, the chief cause of those mentioned has been the small salaries paid by this College. This has been necessitated by the recent financial condition of the institution, and one of the great advantages which the College may derive from being relieved from debt and having other pressing needs provided for, will be the ability to moderately increase the compensation of its instructors and prevent valuable members of the faculty from being called away by higher salaries offered elsewhere.

On the 25th day of October, 1889, death removed Mr. W. Horace Soper, the Registrar and Treasurer of the College, who had served it faithfully in that capacity, for two years. Mr. Soper was an extremely conscientious and painstaking official, and his long connection with educational matters and wide acquaintance in the State, made his services doubly valuable to the College.

THE COLLEGE FARM.

Only a small part of the estate is required for experiment purposes, not over fifty acres in any one year, although this area may be changed in location from time to time. Consequently most of the land remains to be managed as a college farm. It is useful for this purpose, furnishing grain, fruit and vegetables for consumption at the College, and forage for the teams and the cows. The regular operations of the stable, the garden and the field, afford practical illustrations to accompany the section-room work of the classes in agriculture.

[About one hundred acres of land are thus available for mowing and cultivation in general crops, besides garden, orchard and one large pasture. The usual force employed is a foreman and from one to three laborers, according to the season; also two teams.] Besides the regular farm and garden work, there are constant demands on this little force for hauling fuel and supplies and moving baggage for the College, and for labor on the drive-ways and college grounds.

Two years ago the farm was in a most discreditable and discouraging condition, having been worked on the "shares" system, or not at all, for some years before. The main object for the two seasons covered by this report, has been to bring the farm into a systematic and presentable condition, rather than make it immediately profitable. Although in both years unfavorable conditions have prevailed, the general result has been better than was expected. The following account omits the first six months of 1888, and the last four months of 1889, (which will go into the next report) yet it shows the expenses and products for the period included and should be regarded as decidedly satisfactory under the circumstances.

The Farm Account—July 1, 1888, to August 31, 1889.

DEBITS.

For labor.....	\$1,020 93
" board of laborers.....	136 00
" supplies, fertilizers, feed, seeds. &c.	300 40
" tools and implements.....	80 63
" smithing and other repairs.....	51 68
" cow.....	35 00

CREDITS.

	\$1,624 64
From sales of live stock.....	\$ 107 00
" " " 1,850 lbs. pork at 6 cents.....	111 00
" " " 1,940 gals. milk at 20 cents.....	388 00
" " " 60 lbs. butter at 25 cents.....	15 00
" " " 350 bus. potatoes at 50 cents....	175 00
" " " 40 doz. tomatoes canned.....	40 00
" " " vegetables and fruits.....	181 86
" " " grain and other products.....	210 76
" " " ice, 2 seasons.....	112 50
From labor of men and teams.....	91 00

Total credits.....\$1,432 12

Excess of Debits.....192 52

\$1,624 64

An apparent loss of less than two hundred dollars in conducting a farm under such conditions, for parts of two years, is not discreditable to its management. But in fact there was no loss; the value of the purchased feed and manure remaining on the place at the close of this period, much exceeded two hundred dollars. Moreover, persons familiar with the property say that its actual farming value, at the close of 1889, was at least a thousand dollars more than at the beginning of 1888. It is not the cash balance alone that determines the result of operating a farm for a year or two.

Besides the articles which enter into the above account there have been produced and consumed on the farm, during the years 1888 and 1889, or are still on hand, the following:

50 tons of hay,	50 tons of oat straw,
60 tons corn stover,	60 tons wheat and rye straw,
130 bbls. corn,	150 tons ensilage,
330 bus. wheat and rye,	600 bus. oats,
200 bus. small potatoes,	5,000 heads cabbage.

Although no grain was grown in 1888 except oats, a fair crop of wheat, for the season, was produced and safely harvested in 1889. Three hundred and four bushels of wheat were threshed, or more than enough, at usual mill allowance, to make all the flour used at the college, for a year. The college might say, for this year, that it made its own bread, and more. But the wheat had to be sold and the flour purchased. The millers selling flour to the college would not take the wheat in exchange, on any terms. On comparison, it was found that the flour cost considerably more than the wheat (enough to make it, including toll) sold for. This illustrates one of the disadvantages under which all Eastern grain growers are laboring to-day. It is so good a case in point, that the details are given in the report of the Experiment Station, under the head of "Cost of Threshing Wheat."

The general condition of the college farm, in the Spring

of 1888, was such as to make it of the greatest importance to increase as fast as possible, the home production and application of manure. But the live-stock owned by the college was few in number and no funds were available to increase it. An arrangement was therefore made between the Committee on the farm and the President of the College, to keep a herd of cattle, the private property of the latter, on the place. The owner provides the grain food, and the college gets most of the products and all the manure. It is an advantageous arrangement for the time, as the quantity of feeding stuffs already brought upon the farm and fed there, amount to more in fertilizing value, and in better form, than a good many tons of commercial fertilizer. The farm is fast showing the effects of the large quantity of manure now made and applied. Yet, whenever means are available, the farm should be well stocked by appropriate animals owned by the institution.

The farm buildings on the place were burned some years ago and have never been properly replaced. One temporary building after another has been cheaply constructed, until a group has resulted which, although fairly providing for immediate necessities, furnishes a farm equipment wholly inappropriate for such an institution. Shedding and storage are insufficient and considerable repairs are needed.

All lands in use by the Experiment Station has been newly fenced by that department. But otherwise the fences on the farm are about gone. Old drains need relaying and new ones should be added. Much road-work is needed, resulting from years of neglect. The farm implements and machinery are old and insufficient. The live-stock is old and fast becoming useless. There is not a respectable team on the place; one of the two horses is said to have been in service here for more than twenty years, and one of the two mules apparently still longer. There has been disease among the college cows for several years.

The college farm is therefore in need of new live-stock and substantially a new equipment, with other betterments,

to make it creditable to the State. These wants cannot be provided from the regular income of the institution. The Board therefore recommends a special legislative appropriation of two thousand dollars (\$2,000.) for these purposes.

THE EXPERIMENT STATION.

Organized in accordance with the law, as a department of the College (as already explained,) located upon the college estate—governed by the same Board of Trustees, and under the same executive officer, the Experiment Station has its own land, buildings and equipment, as well as its special income, and almost independent existence.

The First Annual Report was for the year 1888, and fully described the history, establishment and operations of the Station during that period. The Second Annual Report for 1889, is submitted herewith and gives the further progress of this department of experiment and research. The present organization of the Station, and a financial statement for the fiscal year last closed, will be found in connection with the report.

[The province of the Agricultural Experiment Station is clearly defined by the law creating it. It is not to be a "Model Farm," as contemplated by the original college charter—nor even a "practical" farm, conducted for pure profit, and while it will incidentally grow grass and grain, and produce vegetables and fruits, milk and meat, the one crop to which it specially aims, *is information*—"useful and practical information on subjects connected with agriculture."]]

While the Station is constantly and increasingly useful to the College and its students, in affording object lessons and illustrating both the theory and practice, its legitimate pugilage is comprised of the adult farmers and gardeners of the State. The General Assembly is asked to extend the usefulness of the Station by aiding to publish and disseminate the information there obtained.]]

The work of an agricultural experiment station being comparatively new in this country, the Board thought it

wise to authorize its Committee on Agriculture to appoint a sub-committee, to visit some of the older experiment stations of the country, for the purpose of inspecting their facilities and methods, comparing results, and obtaining information useful in the management of the Maryland Station. This sub-committee performed its duties in October last, and its report contains so much matter of general interest, and shows so plainly how the Station in this State compares with those in other States, that the report is appended in full and will be found to repay careful reading.

FERTILIZER LAWS.

A law exists in Maryland, intended to somewhat regulate the trade in commercial fertilizers and to guard the consumers of these articles against fraud. Under this law the College is charged with the duty of chemical examination or analysis. The appended report of the Professor of Chemistry shows that he has made seven hundred analyses at the College, during the past two years under the operation of the law. Although at first, the farmers of the State were slow in availing themselves of the privilege of the law, they are doing so more and more. As the work increases the operation and efficiency of the law itself commands more attention.

In this connection, reference is made to a paragraph on "Fertilizer Control," in the accompanying report of a Committee of this Board. A better law seems to be needed in this State to accomplish the objects sought. The present law is unequal in its burdens, as a good many manufacturers and dealers, large and small, do business in this State without paying fees, or giving any attention to the law. It seems plain that the annual investigation should include all the different grades or "brands" of commercial fertilizers sold and used in the State and that information as to their composition and value should be published as soon as possible and thoroughly distributed for the guidance and protection of buyers. The labor at the College,

under the present law, is considerable and is increasing. It ought to be made more generally useful. But it is now deprived of the greater part of its value, and reduced to almost private work, by the absence of any legal provision to make the results public, by publication.

THE BOARD OF TRUSTEES.

Numerous changes have been made in the composition of this Board since the organization of the college. The purpose seems to have been to equitably guard the different interests vested in the institution. The original contributors or "stockholders" founded the college; the State subsequently became a half owner, by purchase, and a regular contributor to its support; and the Federal Government has added to the endowment, as gifts to the industrial classes and those "actually engaged in farming," in this State. Accordingly, the State, the stockholders and the "practical farmers," are now, and should continue to be, represented on the Board of Trust. But there is still room for improvement. The Board is too large for the convenient and economical discharge of its duties. Business could be expedited and the interests of the State and the College better served, if the board were smaller and less liable to be hampered in its action by absentees from its meetings. It is a very difficult matter to get together at a given time and place so many persons, residents of every part of the State, all busy men and some occupied with more important public duties.

It is therefore recommended that the General Assembly should at its present session, consider the expediency of reducing the number of this Board of Trustees, by omitting some of the *ex-officio* members now provided by law, or otherwise, in the discretion of the Legislature.

NEEDS OF THE INSTITUTION.

It is generally conceded that the first legislation in this and other States, to promote agricultural education, was considerably in advance of the demand. Hence these insti-

tutions have been supported through a series of years without being properly appreciated and patronized. There is now, however, abundant evidence of an increasing interest in this line of education, and "The People's Colleges," as they have been called, are feeling the good effects of it, in various parts of the country. All facts considered, the Maryland Agricultural College, with its new Experiment Station Department, is in an encouraging condition. The farmers all over the State, individually and through their organizations, are showing more and more interest in it. Within a year the institution has been visited and reported upon favorably, by regularly appointed inspecting committees from the State Farmers' Association, the State Grange, the Sandy Spring convention of Farmers' Clubs in Montgomery County, Farmers' Clubs from Baltimore, Harford and Prince George's counties, and several local Granges of the Patrons of Husbandry.

But every educational institution must be progressive in order to be practically useful. And progress or growth is only made possible by adequate means. The present condition and needs of this College have been described in detail in this report. For convenience these needs are now repeated:

First: A continuance of the annual appropriation, or State donation, of six thousand dollars.

Second: A special appropriation of thirteen thousand five hundred dollars to free the institution from debt and stop all interest charges on its part.

Third: Special appropriations to preserve, repair and improve the college buildings and grounds, estimated on page 11, at eleven thousand five hundred dollars and to improve, re-stock and equip the college farm, estimated at two thousand dollars.

The total amount thus recommended for special appropriation at the present legislative session is twenty-seven thousand dollars (\$27,000). It is believed that all this is necessary to do justice to the institution and to the inter-

ests of the State therein. And it should be noted that if these grants are made they will be less than would have been paid by the State (\$30,000), had the annual donation been continued without interruption.

The General Assembly is requested to authorize its appropriate committees to visit the Agricultural College and verify the statements of this report and the expediency of action upon the recommendations herein contained.

Attention is particularly invited to the appended report already mentioned, of a committee of this Board which lately visited Agricultural Colleges and Experiment Stations in other states. This visit proved so interesting and valuable that it is suggested that the Legislative Committee to visit the Maryland Agricultural College, or a subcommittee thereof, be authorized to also visit, for comparative information, the State College of Pennsylvania.

Very respectfully submitted, for the Board of Trustees, by its Executive Committee.

[Signed]

GEO. R. WILLIS,

Chairman.

HENRY E. ALVORD,

President of the Faculty.

REPORT OF COMMITTEE OF TRUSTEES TO VISIT
OTHER STATES.

December 5th, 1889.

To the Board of Trustees Maryland Agricultural College:

GENTLEMEN:—In accordance with the action of the Board at its June meeting the Committee on Agriculture, at a meeting held in Baltimore on the 30th of September, appointed a sub-committee, consisting of the Chairman and Messrs. Seibert and Silver, to visit several Agricultural Experiment Stations in other States. This sub-committee met at Baltimore on the evening of Wednesday, October 2nd, and were occupied with the duties stated, until Thursday evening, October 10th. During these eight days, the Committee, accompanied by the Director of the Maryland Station, visited the following named institutions:

1. The Pennsylvania State College and its Experiment Station, at State College, Centre Co., Penn.
2. Cornell University and its Experiment Station at Ithaca, N. Y.
3. The New York Agricultural Experiment Station at Geneva, N. Y.
4. The Massachusetts Agricultural College and the "Hatch" Experiment Station attached to it, at Amherst, Mass.
5. The Massachusetts State Agricultural Experiment Station at the same place.
6. The Connecticut Agricultural Experiment Station at New Haven, Conn., and
7. Delaware College and its Agricultural Experiment Station, at Newark, Del.

Although the Experiment Station of New Jersey, at New Brunswick, lay directly on the line of travel, it was not visited, as had been intended, because of the then very recent death of its distinguished Director, Dr. George H. Cook.

It is manifestly impossible to give, within the limits of an ordinary report, any complete account of all that was seen and learned by the several members of this sub-committee, and it is only proposed to here present some of the leading facts and features which attracted special at-

tention and may prove useful to the full Board. The members of the Committee express the opinion, however, that by having the opportunity to see what is being done in other States, how it is being done and the facilities for doing it, they are individually and collectively better able to judge of the duties and needs of the Maryland Station, and the execution of its work and will be thus greatly assisted in the discharge of their duty as Trustees of this Station and also of the College as well.

ORGANIZATION.

The plan of organization and the relations of the Stations to the Colleges with which they are generally connected, differs materially in the several States visited. In Pennsylvania, the Experiment Station is a department of the State College, located upon its farm but with distinct lands and buildings, all under a Director. The college is large, and varied in its work, including both sexes, and occupies the full time of its President, although he is the nominal head of the Station. The College Farm has its own set of buildings and is conducted entirely distinct from the area allotted to experiment work. One or two of the regular College professors do more or less work for the Station, in special lines of natural history, but the Station has its full corps of workers, only one or two of whom occasionally give agricultural instruction at the College. The Board of Trustees, governing College and Station together, is quite large, but it meets only once a year, as a sort of convention, to decide general questions, and delegates the current management to an executive committee of five.

At Cornell University, the Experiment Station, supported entirely by "The Hatch Act," has been engrafted upon the existing University as a department. Its Director and all the principal Staff officers, constituting its immediate governing "Council," are University professors. None of these are paid for this extra service but each is furnished with a

paid assistant, especially appointed for experiment work. These assistants really do the station work, the duties of the Director being largely performed by a Deputy. Only two or three of the professors have given much personal attention to experiments, the notable exception being the professor of Horticulture, who gives his time, first, to experimentation and afterwards attends to whatever teaching in his line there may happen to be. None of the active Experiment Station workers, or "Assistants," are instructors. The accommodations under cover and in the field, are so closely connected with the land and buildings of the University, being under the same direct control, and the whole agricultural feature of Cornell, is so overshadowed by the extended proportions of the other departments of this great University, that the Experiment Station hardly makes the impression which it deserves, upon the transient visitor. The full Board of Trustees meets but once a year and vests nearly all its authority in an executive committee of five, of whom the President of the University and the resident ex-President, are members.

The New York Agricultural Experiment Station, founded some years before the passage of the Hatch Act, occupies a fine estate at Geneva and is devoted exclusively to the work of agricultural investigation and experiment. Its officers consist of a Director and five or six Staff workers, all of whom do much service in connection with the State Farmers' Institutes and other agricultural meetings and exhibitions, but no teaching otherwise. The Station is governed by a Board of Control consisting of nine members, who are appointed by the Governor, a few at a time, for a term of years.

In Massachusetts, quite a complex organization results from keeping two distinct Experiment Stations in operation within the limits of one farm. Before the Hatch Act, the State Station was located on a part of the College Farm, and buildings specially provided for it. This State Station continues, with its Director and Corps of Assistants, having no direct connection with the College, while the benefits of

the Hatch Act, being assigned to the College, support a new department therein, called the Hatch Experiment Station. Of the latter, the college president is Director, and the professors are the Staff officers, although all are assigned special assistants for the purely experimental work, and these assistants do not teach. The "Hatch Station" is partly quartered in College buildings and partly provided for by special structures erected or now in progress. The Massachusetts Agricultural College has a Board of seventeen Trustees and the State Experiment Station is governed by a Board of Control, of eleven members.

The Connecticut Agricultural Experiment Station is the oldest institution of that name and description, in continuous existence in this country, although the original charter of the Maryland Agricultural College, years before indicated that that was intended to be virtually an Experiment Station, as well as a College. For some years connected with the Sheffield Scientific School of Yale University, this Station is now independent and occupies a property of its own in the suburbs of New Haven. No teaching is attempted, except through its experiments and publications. The work is largely conducted in the laboratory, but little land being owned. The officers consist of a Director, vice-Director and several Staff workers, most of them laboratory assistants. The Station is under a Board of Control consisting of seven members.

In New Jersey, the Station is of several years standing and organized and conducted, as we are informed, much as in Connecticut.

The Delaware College and Station are on the same ground, governed by the same Board, which is large and cumbersome, and in its organization there is a close relation between the work of investigation and the work of instruction, by reason of the mixed duties of its officers.

In general, there has been a marked effort to have the governing power of Stations and Colleges unified and simplified and to secure for active Station Workers, as great

freedom as possible from duty as regular teachers. The greater the experience, the firmer the conviction that experimenters, to do good work, must have their time freed from regular duties of any other kind, to any extent. At the same time, station workers are often found very useful as lecturers and special but irregular instructors, at the colleges and also at public meetings. And, similarly, college professors are often advantageously employed to do work for the stations as specialists, when their duties as regular teachers do not interfere. In all cases, there has been active emulation, not to say rivalry, in the efforts of stations to secure as members of their active working corps, young men specially qualified by scientific education and training for this peculiar line of work. Such as have had experience in original research and especially in agricultural experiments, have commanded a premium and been eagerly sought wherever they could be found. While some institutions, like Cornell University and the Massachusetts College, have been able to find the right kind of men among their own graduates, and had some to spare for other States, in most cases the Stations have sought their help irrespective of geographical bounds and solely upon the standard of special fitness. Thus Pennsylvania has called men from Wisconsin and Massachusetts, the New York Station from Maine and from Washington, the Massachusetts Stations from Virginia and Maine, Delaware from Cornell and elsewhere.

Comparing the plans of organization, executive management and the *personnel* of the working forces, as examined in other States, with the same features of our Maryland Station, your Committee is satisfied that we have so far done wisely and well at our institution and cannot improve by any changes at present, in these particulars.

FACILITIES FOR STATION WORK.

Some of the facilities for experiment work at the several institutions visited, especially as to lands and buildings, have already been incidentally mentioned. The provisions

for these Stations ought to be good, for with the exception of Delaware, every State named has made liberal appropriations for their Agricultural Experiment Stations, in addition to the yearly income under the Hatch Act.

The Pennsylvania Legislature gives \$5,000 a year, and a fine Station building, (containing offices, laboratories, library, etc.,) has been lately erected, as well as an excellent dwelling for the Director. The Station has also a set of farm buildings and one hundred acres of fine limestone land, rather hilly and perhaps naturally too fertile, although its productiveness and clean cultivation are attractive. At Cornell University, nothing has been spent for building except the allowance provided by the Hatch Act, but the use of buildings on the estate has been given, necessary alterations made, and special glass-houses built for the horticultural and entomological work; the Station is thus pretty well provided for at small cost. The land at Cornell is fertile, but very uneven and not at all suited to extensive field experiments. The New York State Station at Geneva has a large tract of land, admirably adapted to field, plot and garden experiments of all kinds; a new barn costing \$10,000 has just been completed for investigations with live-stock, and there are also green-houses, an experiment dairy, and ample laboratories and office rooms. This property is valued at \$100,000 and the Station receives \$25,000 a year from the State for current expenses. The State Station at Amherst, Mass., has very fine and appropriate buildings erected by the State at a cost of over \$30,000. One brick structure contains the offices, library and chemical laboratories, and another is designed for the study of plant growth and diseases, arranged so the plants can be completely housed, simply roofed over, or entirely exposed to the weather; a complete set of farm buildings is added, with stables built especially for feeding experiments with horses, beef cattle, milch cows, sheep and swine. As a whole this Station has the most carefully designed and completely arranged buildings of any visited. It receives

an annual appropriation of \$10,000 from the State. About forty acres of land, originally part of the college farm, but now permanently assigned to the experiment work, are well suited to that purpose. The "Hatch Station" is distributed through the buildings and grounds of the Massachusetts Agricultural College, and provided for much as at Cornell University, receiving like that, only the Hatch endowment; a very finely equipped meteorological department, with self-recording instruments costing about \$2,000, is one of the notable features of this institution, and an excellent building is just being completed for the special study of questions connected with the health of domestic animals. The Connecticut Station has a good wooden building for general offices, a brick chemical laboratory and a special building for work on vegetable diseases; there is no land for field work and just enough for a "grass garden." The Connecticut Station receives \$12,000 a year from the State, in addition to its income under the Hatch Act. In Delaware a brick building has been constructed for the Station, on the College grounds; this institution has no land for experiment purposes, except what it can borrow or lease; the State gives this Station no aid.

In every instance certain requisites for good work have been recognized as essential and well provided, such as commodious and well-fitted offices for business, editorial and clerical work, a chemical laboratory with the necessary and latest appliances for the finest work in this progressive science, and large and well selected libraries of reference. Generous expenditures have also been made at the different Stations for scientific apparatus and equipment for microscopic work, photography and various lines of special investigation. Pennsylvania and Massachusetts have elaborate outfits for pot experiments; Geneva, Cornell and Massachusetts for horticultural work; Connecticut, Delaware and Massachusetts for plant physiology; Cornell and Massachusetts have new insectaries, and some special provisions for experiments with animals and in the dairy, have been already noted.

After seeing the labor and expense incurred to provide for this work in these other States, your Committee is gratified to report, that the Rossburg building, as remodeled, refitted and equipped for the Maryland Station, furnishes facilities for the work in this State which should be regarded as very satisfactory. Our general building, offices, library, laboratory, work-rooms, provisions for water, gas, steam-heat and power, and our scientific appliances and equipment, are fully equal to the average of the Stations visited. The out-buildings of our Station should be completed and a green-house added as soon as possible. Our land already compares favorably in extent, variety of soil, and exposure, with that seen elsewhere, and when properly drained, will be second to none in suitability for field experiments.

WORK IN PROGRESS.

The bulletins and reports of the several Stations, gave a good idea of the work done, and that now in progress will soon be recorded in the same way. The preceding description of facilities, indicates the special lines of investigation receiving attention in different States. The great variety in the work as a whole, and the tendency to specialization at every Station, are very notable features. In Pennsylvania much field-work is done, and several acres are cultivated in plots. Pot experiments and feeding and digestion studies are also specialties at this Station. At Cornell University, horticultural and entomological work are most prominent, although interesting experiments with animals, manures and field crops, are also generally in progress. The New York Station at Geneva, while conducting extensive experiments with field and garden plants and fruits, is now preparing for special work connected with the great dairy interests of the State; five or six dairy breeds of cattle will be scientifically compared, through a term of years, besides numerous collateral enquiries. This Station is also engaged in experiments with poultry. The Massachusetts State Station does much chemical work, and carries on extended

MARYLAND AGRICULTURAL COLLEGE.

feeding experiments; it is now making elaborate preparations for the study of plant diseases; and in the field, forage crops are the specialty. The Hatch Station of the Massachusetts Agricultural College has for its prominent work, horticulture, entomology, meteorology and animal diseases. At the Connecticut Station, and also in New Jersey, the work is mainly in the chemical laboratories; forage plants are specially studied at New Haven; and having no land at home, a system of co-operative field experiments by farmers in various parts of the State, is managed from the Station as a centre, but with only moderate success. The Delaware Station is working specially on horticulture and plant diseases, with a good deal of incidental chemistry.

Again comparing the work in other States with that of our home Station, a general similarity is observed, but it is recommended that the Maryland Station should gradually concentrate its efforts upon a few lines of work, well chosen with reference to the varied farming interests of the State. Subjects which should have special consideration are, the renovation of worn soils; the selection and use of commercial fertilizers; the important crops for packing and the fruit and truck markets; forage crops and feeding stuffs, and the problems of animal nutrition. It is suggested that a comprehensive investigation of the production of eggs and poultry for market, would be interesting and profitable to almost every part of the State. Experiments with domestic animals should be cautiously tried, as they are uncertain and expensive, but something in this line should be done every year. Besides these main lines of work, the facilities at hand will permit, as at most of the Stations, numerous other tests and transitory experiments which may prove valuable.

FERTILIZER CONTROL.

In nearly all of the States visited, laws are in operation, and found every effective, regulating the manufacture and sale of commercial fertilizers and ensuring against imposi

tion those who buy and use these very mysterious and uncertain materials. The two features of the laws giving greatest satisfaction are the annual inspection, sampling and chemical analysis under State authority, of all fertilizing materials sold in the State, and the early publication and wide dissemination of the facts thus obtained. Neither of these essential points have place in the present Maryland law. In most cases, the duty of executing the law is assigned to the Agricultural College, or Experiment Station, or to some officer of one or the other. The experience of the Experiment Stations is, that this duty of fertilizer control is very exacting and exhausting and virtually puts an end to other work and experiments proper. This is especially true in Connecticut and New Jersey, where the Experiment Stations, two of the oldest in the country, and both receiving large State appropriations, have been almost wholly occupied analyzing chemical fertilizers from two-thirds to three-fourths of the year, and had little time, energy or money for anything else. The younger Experiment Stations are taking special pains to avoid having the drudgery incident to Fertilizer Control laws put upon them. At some of the Colleges it is well managed, however, and the Fertilizer work can be largely done by student labor, partly as instruction and partly furnishing remunerative employment to college graduates who wish to pursue advanced studies. There is a lesson here which it seems well to keep in mind, in connection with the Maryland College and Station, and any new fertilizer laws that may be enacted in this State.

COLLEGE NOTES.

Although the duty of the Sub-Committee was especially to see and enquire into Experiment Stations and their work, this report already shows that a good deal was incidentally seen of Agricultural Colleges, in three or four States and it is deemed proper to add some notes as to these colleges, which may be interesting and suggestive to all members of this Board.

The Pennsylvania State College has grown from the Farmers' High School, established in 1854. It is now the Agricultural College of the State, or perhaps we should say, the Agricultural and Mechanical College, receiving the benefits of the U. S. Land-grant of 1862. As such it is about the age of the Maryland Agricultural College. For years the Pennsylvania College had an uncertain existence, neglected by the State and unappreciated by the people. But under wise and energetic management, it has lately come rapidly into public favor, students have increased and liberal appropriations have been made by the State. Within two years over \$200,000 has been expended on new buildings and permanent improvements and the plans on which work is now progressing, contemplate an equally large additional sum to be appropriated during the next two years. The College is not in or near a town, but located in the country, two miles from a railroad and on a large farm of its own. Some specially attractive things at this college are the substantial residences for nearly all the numerous professors, the fine armory and drill-hall, the growing mechanical department, and the central steam-plant just established with artesian well, which supplies water, light, heat and power to all the buildings. Notes were made by members of the Committee upon the generous supply of scientific apparatus, models and facilities for instruction; also upon several styles of durable and appropriate furnishings for the public and private rooms. Although the Agricultural College, this institution covers broader ground. It admits both sexes, and offers twelve distinct courses of instruction; its mechanical department is very popular and finely equipped. But with a roll of almost 200 students, there are less than a dozen pursuing the agricultural course, and not one of these in the senior class, which numbers fifteen. The last graduating class was nine in number, one member completing the agricultural course. As an Agricultural College our Maryland institution to-day makes a better showing in number of students and as a State Col-

lege, we have a much larger attendance in proportion to population.

Cornell University was founded upon the United States Land Grant or "the Morrill Act" of 1862. It has since received munificent private gifts and grown to be a great University. Originally the Agricultural College of the State, and still such by law, its Agricultural Department is insignificant compared with others. The Sibley College of Mechanic Arts is one of the great divisions, with buildings, equipment and endowment of its own representing hundreds of thousands of dollars. The students at Cornell now number just about 1,300. Of these *nineteen* (19) are pursuing the regular Agricultural course, and about as many more are preparing for that course. As a State Agricultural College, our Maryland institution compares favorably with Cornell University.

The Massachusetts Agricultural College was also founded on the Morrill Act, and is an agricultural college, pure and simple, the Mechanics Art department being conducted in a separate institution at Boston. After languishing for some years, with forty or fifty students, this College has also come into general favor, the State has been generous making good the losses to the Land-scrip funds caused by injudicious sales, providing fine buildings and now donating \$20,000 a year to its current needs. The College Farm is large and well equipped, money is spent liberally upon it, and it is in high condition, its primary object is held to be illustration and instruction. The whole estate of the College is valued at \$250,000, and its regular annual income is \$44,000. It is regarded as at the height of prosperity and has 105 students enrolled, all studying agriculture. (This institution more nearly resembles the Maryland Agricultural College, in organization and management, than any other visited. Few students pass a year at the Massachusetts College for less than \$250 and as a rule they spend over \$300; at the Maryland College the average total cost is below \$200. Including five

per cent. interest on the plant, the Massachusetts College spends annually public funds amounting to \$543 per capita on its students; the public cost of students at the Maryland College is at the rate of \$398 per capita. The per capita cost in New York and Pennsylvania is greater than in Massachusetts.

These gratifying facts may therefore be stated, that Maryland has more students pursuing the regular course at her Agricultural College than at the similar institutions in the great Keystone and Empire States and that compared with the investment, the Maryland College has more students than the Massachusetts College, while in Maryland students attend college at a much less cost, both public and private, than in Massachusetts, New York or Pennsylvania.

IN GENERAL.

The Committee were much impressed by what they saw at the Experiment Stations visited, including some of the oldest in the country, and with their completeness of equipment and the extensive and substantial character of the work. The comparisons with our Maryland Station were encouraging, and while we got many suggestions for future improvement, we feel that for the length of time established and the means available, our institution has made substantial and satisfactory progress.

At all the Stations, the opinion is positive that the active workers must have thorough scientific training and must be free from any considerable demands as teachers in the class room. But all the authorities unite in placing a high value upon the active participation of Stations and station men in the work of the various organizations in aid of agriculture, especially public meetings and exhibitions.

It was found that in nearly all the States visited, the principle has been recognized that, as the regular Stations have been established and are supported by the Congressional appropriations, so that the useful knowledge obtained is without cost to the States, the latter should respectively

provide, in connection with the usual public printing, for the publication of the Bulletins and Reports of the Stations which are carried free through the mails. Most of the States named, as already specified, do much more than this, to supplement the Federal grants to their Experiment Stations. As nothing has been asked of the State for the Maryland Station, your Committee believe that the Legislature may very properly be petitioned to publish the Annual Report and Bulletins of our Station.

The Committee wish here to suggest that cordial relations should be maintained between this Institution and the United States Department of Agriculture, in order that the lands and facilities of the Maryland Station may be utilized as much as possible by the National Department—and mutual advantages thus secured.

As already remarked, the incidental observations of the Committee in connection with the State Colleges, as distinct from the Experiment Stations, were decidedly encouraging as to the future of our own. There has been recently manifested a marked improvement in public sentiment regarding this class of higher educational institutions, called by many "The People's Colleges," and something of the liberality shown by the Legislatures of other States, may be hopefully urged and expected from that of Maryland. Our College is sadly behind those of other States in modern and commodious buildings, and in general equipment. We particularly need more of the many appliances which are deemed essential to success in the modern methods of studying those branches of natural science which are at the foundation of all progress in agriculture and the other arts and industries. The Committee believe that this Board should appeal to the next State Legislature for special assistance for the College, in these particulars.

It should be remembered that although the original character of this College contemplated no technical instruction except in agriculture, the Act of Congress of July, 1862, which was accepted by this State in 1864, and which now

contributes more than half the annual income of our College, was much broader in its terms. Consequent upon this, the Laws of Maryland of 1865, chapter 178, define "the leading object" of the Maryland Agricultural College to be, "to teach such branches of learning as are related to agriculture and the mechanic arts, in order to promote the liberal and practical education of the industrial classes, in the several pursuits and professions of life." The Committee find that in the Colleges where mechanics arts departments have been established, they have proved useful and attractive and have very materially increased the number of students. The Committee therefore ask the Board whether the time has not arrived for the Maryland Agricultural College to enter upon this heretofore neglected branch of its legal duty. If so, special application should be made to the Legislature for the means necessary to provide the plant for instruction in the mechanic arts.

CONCLUSION.

The Committee wish to express, in conclusion, their full appreciation of the many kind and courteous attentions received at the several institutions visited. At every place, the officers exerted themselves to make the duties of the Committee pleasant and effective, by arranging for economizing the time and in many ways increasing the opportunities for observation and information. The thanks of the Committee are due for their cordial reception and the repeated instances of public and private hospitality.

The experience of this Committee leads to the recommendation that at some suitable future time, a similar tour of inspection be made by a committee of the Board, with special reference to the development of the educational branch of this institution.

Signed:—F. C. GOLDSBOROUGH,
J. P. SILVER,
DAVID SEIBERT,
Committee.

REPORT OF THE DEPARTMENT OF AGRICULTURE.

MARYLAND AGRICULTURAL COLLEGE,

20 December, 1889.

Pres. H. E. Alvord:

DEAR SIR:—In compliance with your request, I herewith submit a brief report of the Department of Agriculture for the years 1888 and 1889.

Agriculture, as a scientific and practical subject had been taught to a very limited extent in this institution, until recent years. For reasons, doubtless satisfactory to the ruling Board, it had been crowded into a corner, and other departments were pushed to the front. Now, however, it is the characteristic study of the College, as it should be, and is well to the front as the special technical feature. A very full course has been taught for the last three years, and lectures on agriculture by the President have been added. [I am confident there is not now an Agricultural College south of Baltimore with a more complete Course on Scientific and Practical Agriculture.]

Since the establishment of the Experiment Station in connection with the College, where scientific principles find practical embodiment, and the student can find daily object lessons of great interest and value, a still greater impetus has been given to agricultural studies.

Each student is required to study the Course from the beginning of his connection with the College to the ending of the same, and I am glad to say, it is done, by each one, with a pleasure amounting to enthusiasm.

[The studies of the first year embrace the principles of Stock-breeding, including Heredity, Atavism, Correlation, Variation, Fecundity, In-and-In Breeding, &c., &c.; the history of Breeds, and the care of Stock. Dairying and Dairy Farming are taught by lectures from the President during the Spring term.

The second year's study embraces Anatomy and Physiology of animals and plants, involving a critical study of the structure of plants and animals, the offices and functions of their organs, the plant as a living thing, as well as its chemical composition.

The third year's study embraces the Atmosphere as related to Vegetation, the Soil as related to Vegetable production, the Rocks and Soils, Physical character of Soils, and Soils as a source of food to crops.

The fourth year's study embraces, during the Fall term, a course of thirty lectures on General Farming, General and Special Crops; during the Winter term a course of ten lectures on the Grasses, Natural and Artificial, and twenty lectures on Manures, Natural and Artificial or Commercial; during the Spring term a course of twenty lectures on the Science and Economies of Feeding.]

I have been thus specific so that the full scope and purpose of this department may be known, and that all who are interested in the Agriculture of our State may be satisfied that this feature of the College is well sustained.

Respectfully submitted,

[THOS. N. CONRAD,

Prof. of Agriculture.]

REPORT OF THE DEPARTMENT OF NATURAL
HISTORY.

MARYLAND AGRICULTURAL COLLEGE,

December 27, 1889.

President Alvord:

DEAR SIR—In compliance with your instructions I submit the following report:

During the Fall the Freshmen study the surface features of the earth, and the action of water in streams and oceans upon the structure of the land. The fields and streams near the College, together with a relief map of the United States, and a full set of wall maps, are used in illustration. The Winter is occupied with a careful consideration of the weather and climate in their effects on soils, plants and animals. The various forms of life and their distribution over the earth receive attention. A set of astronomical, climatic and zoological charts; the daily weather reports of the United States Signal Service; and the weather instruments of the Maryland Agricultural Experiment Station are used in this connection. In the Spring, the cultivated and wild trees and plants—including the weeds—are studied and identified. An extensive herbarium of the flora of Maryland, and a choice collection of woods, and of farm and garden seeds, in the College museum, are aids in this work.

The Sophomores devote the Fall and Winter to the study of the making of rocks and soils by the air, water, and living things; the formation of plains and mountains; and the progress of plant and animal life. They also identify the important minerals of this State. A well selected and very valuable set of minerals and rocks owned by the College, is used for reference. In the Spring, the domestic and wild animals are studied and identified, special attention being given to the naming of insects and birds in

the field. Under the guidance of the instructor, the class visits the collections of animals in the United States National Museum and Zoological Park at Washington, D. C.

The Juniors study the details of the structure of the various animals and plants, using as types those with which men most often come in contact, as: the horse, cow, hen, frog, perch, beetle, oyster, earthworm, polyp, bacterium, yeast, mould, moss, fern, corn, potato and apple; and study these in the field as much as possible. Mounted skeletons of man, the horse and the cow are studied in the class-room. The necessary dissecting instruments, lenses and imported microscopes, are supplied by the College.

The Seniors study the life actions of plants and animals, especially the life histories of the types whose anatomy the student has worked out. This requires the consideration of the growth of plants; their forms of reproduction; their smut, rust and blight parasites; the action of microbes in disease; the growth of animals; their foods; their nervous systems; and heredity and variation. The course is ended with a thorough study of the human body. The necessary chemical reagents and apparatus, a sliding microtome, the microscopes mentioned, and a small laboratory, are at the service of the students.

Thus, by work carefully adapted to his advancement, every student, from his admission to his graduation, is continuously occupied with the study of living things and their environment.

The most of our apparatus has been purchased by the College during this year. The equipment of the present laboratory with gas and water fixtures, and the addition of a large globe, and a microscope of high grade, with compensating eye-pieces, and apochromatic objectives, are improvements and additions greatly needed. Progress has been so great in this inventive age, that if the youth of this State are to gain the knowledge which the world now has and can use, there must be given them opportunity to use the appliances by which men gained these truths, that the students may see and understand for themselves.

Respectfully,

DICE McLAREN,
Professor of Natural History.

REPORT OF THE DEPARTMENT OF CHEMISTRY.

MARYLAND AGRICULTURAL COLLEGE,

December 26th, 1889.

President H. E. Alvord,

DEAR SIR:—According to your instructions I beg leave to submit herewith, a report of the progress and character of the work in the chemical department for the years 1888 and 1889.

[The work in this department is of two kinds; (1) that relating to the instructions of students and, (2) the analyses of fertilizers, according to the State law.]

I. Realizing the importance of a knowledge of Chemistry to the thorough understanding of other sciences and especially of Agricultural science, I have endeavored to build up this department until it should become a leading feature of the institution. Being well supported in this endeavor by yourself, I feel that I have succeeded in presenting to the young men of the State, a thorough course in Chemistry, practical in its results and particularly adapted to an Agricultural College.

Beginning with the Sophomores, we take up the study of "Remsem's Introduction to Chemistry" which embraces chiefly [the non-metallic elements and their compounds. This is supplemented with and fully illustrated by experiments. Then follows the study of the metals and their compounds, after which the students are prepared to begin practical work in the laboratory. Here, during the last term of Sophomore year, the students by constant repetition, soon learn to determine simple substances in solution.

The Juniors successively study qualitative and blow-pipe analysis, volumetric quantitative analysis, and organic chemistry from the text-book. The book used is "Remsen's Organic Chemistry."

The Seniors take up quantitative analysis of the metal and mineral compounds, including silicate analysis, the first

term. The second term they devote to the analysis of fertilizers, feeding stuffs and dairy products. The third term a choice is allowed of a variety of subjects including practical work in organic chemistry, the analysis of water, urine and gaseous compounds.

In general, the students spends six hours per week in the laboratory, as required by the schedule, although many of them have voluntarily devoted twice that time to the work, to their own great advantage.

II. In reference to my other works, since the first of January, 1888,—I have made analysis of seventy different fertilizers, each in duplicate, and requiring on an average five separate determinations. This practically amounts to 700 distinct chemical analyses.

In these analyses, I do not allow a variation of more than fifteen-hundredths of one per cent. between the duplicates, and in the majority of cases this variation is brought below one-tenth of one per cent.

The gradual increase of this work, together with the increase in the number of students in my department, particularly this year, has greatly cramped me for room. I would therefore ask your attention to the necessity of enlarging the accommodations for this department. Bench room is especially needed, and this could be best obtained by an addition to the west side of the present laboratory building.

Respectfully submitted,

J. D. HIRD,

Professor of Chemistry.

REPORT OF THE DEPARTMENT OF PHYSICS,
WITH GERMAN AND FRENCH.

MARYLAND AGRICULTURAL COLLEGE,

December 18, 1889.

Major H. E. Alvord, President,

DEAR SIR:—In compliance with instructions I herewith present a brief statement of the character and progress of the work done in the department of the College, under my charge, noting also its needs.

Avery's Elements of Natural Philosophy and Steele's Popular Physics are the manuals in the hands of the senior and junior classes. These are supplemented by lectures and experiments. In these studies the classes seem to take much interest, and a better supply of apparatus to facilitate a clear, intelligible presentation of the facts is alone needed here to create real enthusiasm.

Most of the apparatus used in my lectures is my own. It is satisfactory so far as it goes, but more should be added. Very considerable additions are necessary properly to equip the lecture room. I hope attention will be directed to this matter and that an appropriation of money will soon be possible to relieve this pressing need.

The authors whose manuals I use in teaching the German and French Languages enjoy fine reputations, and their works are well received. Joynes-Otto's German Course, I find equal to its pretension, and adequate to the needs and attainments of our students. The Senior and Junior classes are pursuing this study, and the foundation that is being laid is one, I think, on which a creditable knowledge of the language will be secured. Portions of distinguished authors' works will be read during their course, and also written translations made therefrom, to secure exactness in rendering, as well as facility and elegance in expression.

The French, resumed after a year's omission, is pursued according to the same general method. Ahn-Henn's Manual is used, and the usual authors will be read during the course.

Very respectfully yours,

WM. H. ZIMMERMAN,
Professor of Physics, German and French

REPORT OF DEPARTMENT OF ENGLISH AND
LATIN.

MARYLAND AGRICULTURAL COLLEGE,

December 18th, 1889.

President Alvord,

DEAR SIR:—Having taken charge of this department in September, 1889, I have adhered in the main to the course as laid down by my predecessor. This course includes four classes in English, and two, the Freshman and Sophomore, in Latin.

With the Senior class, the work being Political Economy, I have had two recitations, and one lecture per week; the lectures up to end of term being as follows: "On the History and Field of the Science;" "On Production;" "On the Division of Labor;" "On Consumption;" "On Labor;" "On the Efficiency of Labor;" "On Capital;" "On the Relation between Labor and Capital;" "On Money;" "On Exchange."

With the Junior class, I have reviewed the Rhetoric, taken up the preceding year. This was followed by a short History of the English Language, and during the latter part of the term, the Elements of Criticism.

The work of the Sophomore class for the Fall term, has been the History of English Literature, with readings from principal authors.

Owing to the early age at which many enter our Freshman class, and realizing the importance of a sound foundation for future advancement, my work in this class has, of necessity, been of rather an elementary character. Etymology, English Grammar and Analysis, with exercises in Declamation and Composition.

Composition has formed part of the whole English course during this term.

The Latin course, which I found had heretofore extended only through two years, I have been able to carry no further for this year. I have now two classes, one of beginners and

a class reading Virgil. Next year I expect to be able to carry the Latin into the Junior class.

During the term just past, no History has been taught. I shall, however, by the middle of the next term, have a full Historical course established, embracing Ancient, Modern and Constitutional History.

I have overhauled the library belonging to the Mercer Literary Society, and find it in very poor condition, many volumes having been lost or destroyed, and but few books of value as works of reference, to be found on the shelves. I would also call attention to the fact that there is great need of several standard reference books in this department.

Respectfully submitted by,

R. H. ALVEY,

Professor in Charge.

REPORT OF THE MILITARY DEPARTMENT AND
DEPARTMENT OF MATHEMATICS
AND DRAWING.

MARYLAND AGRICULTURAL COLLEGE,

December 16, 1889.

The President, Maryland Agricultural College:

SIR:—I have the honor to make the following report concerning the departments of instruction under my control called for by your circular of to-day.

MILITARY DEPARTMENT.

I assumed control of this department on October 15, 1888. [Drills were at once commenced, and all the students, except those physically disqualified, were instructed three times each week in the schools of the soldier and company without arms, the rifles on hand being unfit for use.] In December, 1888, the latter were turned in, but a new supply was not received till April, 1889. During the Winter term of 1888-89, drills were suspended. In the Spring term, the students were drilled four times each week in the manual of arms, school of the company and skirmishing. On June 18, 1889, the students were inspected, and found proficient, by Col. Lawton, A. I. G., U. S. Army. On June 19, Commencement Day, there was an exhibition drill.

On September 22, 1889, drills were resumed. All but one of the students were drilled four hours per week, when the weather permitted.] The new students were instructed by members of the Senior and Junior classes in military gymnastics, the school of the squad, and the manual of arms, while the old students were drilled in the school of the company by myself, or the cadet captain. About November 1, 1889, the new students passed into the company, and all were drilled by myself in the manual of arms, school of the company and skirmishing. There has been an average attendance of 40 at the drills, during this term; drills have been frequently prevented by rain.

It is desired to drill the students in the manual of arms indoors during the winter, and in the schools of the company and battalion outdoors during the spring.

During the winter of 1888-89 twelve lectures on military subjects were delivered. These will be repeated the coming term.

Recitations in tactics, covering the schools of the soldier the company and the skirmisher, were held once each week during the year 1888-89, with the Senior and Junior classes.

This year the Seniors have recited once in each week in the school of the battalion, and the Juniors, in the school of the company and the squad, and the manual of arms. It is intended to continue these recitations during the year.

It is hoped that two sections of field artillery may be procured from the War Department for instruction in foot artillery drill next spring.

MATHEMATICAL DEPARTMENT.

During the fall of 1888, the Seniors were instructed in elementary surveying with the chain, and in plotting. In the winter of 1889, they were instructed in transit surveying and leveling. In the spring they had practical work with the transit and level, and drawing sections. Also lectures on elementary civil engineering, embracing materials, strains, structures, roads, bridges, etc.)

In the fall of 1888, the Juniors were instructed by recitation in plane trigonometry, and in the winter of 1889, in mensuration of lines, surfaces and volumes. In the spring of 1889, they were instructed by recitation and field work in chain and compass surveying. This class, which is now the Senior, has been instructed by recitation and field work in transit surveying and leveling during the term just closing. It is proposed to instruct them in topography and topographical drawing during the winter of 1890, and in the spring give them more field work in all branches of surveying, with lectures on elementary engineering. In every case, in surveying, each student is required to personally handle and work with each instrument many times. During the

term just closing, the Juniors have been instructed by recitation in the latter part of plane, and all of solid geometry and logarithms.) It is proposed to take up trigonometry and mensuration with this class next term, and chain and compass surveying in the spring.

Until the term just closing, I did not have the [Sophomore mathematics. They have been instructed, in algebra, in equations of the first degree, the extraction of roots and pure quadratics. Next term they will finish algebra, and in the spring take up plane geometry.)

DRAWING DEPARTMENT.

During the fall of 1888 and winter of 1889, the Junior class was instructed in drawing plans and elevations of simple models. In the spring of 1889 they were instructed in drawing the perspective of blocks and buildings, with their shadows and plans. During the fall and winter of 1888 and 1889, the Sophomores were instructed in outline free-hand drawing in copy-books. In the spring of 1889, they were instructed in the use of instruments and in simple geometrical drawing. This class, which is now the Junior, has been instructed during the term just closing in the construction of geometrical curves, and the drawing of projections of blocks with their shades and shadows. During the winter of 1890, they will draw plans, elevations and sections of models, and in the spring, perspectives of models and buildings. The Sophomore class, this fall, has been instructed in outline free-hand drawing in copy-books. During the winter and spring of 1890, they will draw blocks with lead pencil and begin geometrical drawing with instruments.)

Very respectfully, your obedient servant,

[A. B. SCOTT,]

Second Lieutenant, Thirteenth Infantry, U. S. Army.
Professor of Military Science and Tactics, and Acting Professor of Mathematics and Drawing.

MARYLAND AGRICULTURAL COLLEGE, FINANCIAL STATEMENT.

REPORT OF THE COLLEGE TREASURER FROM JULY 1, 1888, TO AUGUST 31, 1889, INCLUSIVE.

W. HORACE SOPER, Treasurer,

in account with

THE MARYLAND AGRICULTURAL COLLEGE.

MARYLAND AGRICULTURAL COLLEGE.

59

Dr.	Source of Receipts.	Ledger Page.	Amt.	Cause of Expenses	Ledger Page.	Cr.
	Balance cash on hand	166	\$648 37	Repairs	197	2,467 36
	Income on Land Scrip Fund	156	9,071 15	Salaries	149	4,375 53
	Fees under Fertilizer Law	156	1,466 00	Equipment	204	516 07
	State donation, '88-'89	156	6,025 00	Old accounts, (debt)	214	5,177 45
	Bills payable, (borrowed)	228	4,500 00	Bills payable, (debt)	228	6,000 00
	Interest and discount	193	34 93	Interest, (debt)	193	687 70
	Farm, cash sales	189	290 09	Farm	188	1,488 64
	Students' accounts	226	5,687 61	Students accounts, rebates	226	190 11
	Boarders, not students	145	637 42	Domestic Department	202	5,015 42
	Old accounts, collected	215	574 35	Coal	151	663 14
				Laundry	151	369 30
				Books and Stationery	153	366 46
				General expenses	178	916 89
				Advertising, insurance and taxes	155	594 96
				Trustees' expenses	191	44 43
				Balance cash on hand	61	46
			\$28,934 92			\$28,934 92

78218

AUDITORS' CERTIFICATE.

We, the undersigned duly appointed auditors for the corporation, do hereby certify that we have examined the books and accounts of the Treasurer of the Maryland Agricultural College for the fiscal period ending August 31st, 1889; that we have found the same correct and showing receipts and disbursements as specified in the statement above; that proper vouchers are on file for all disbursements, which have been examined by us and found correct, and that an unexpended balance of cash of \$61.46, remains to be accounted for in the fiscal year beginning September 1st, 1889.

Signed:—ALLEN DODGE, } Auditing Committee.
Signed:—CHAS. A. WELLS, } Board of Trustees.

I hereby certify, that the foregoing is a true transcript from the books of account of the Maryland Agricultural College, September 13th, 1889.

Signed:—W. HORACE SOPER,
Treasurer.

Note:—The explanations given on pages 11 to 17, inclusive, are necessary to a correct understanding of the Treasurer's report on the last page.

MARYLAND AGRICULTURAL EXPERIMENT STATION.

THE ANNUAL FINANCIAL REPORT, 1888-89.

*The Maryland Agricultural Experiment Station
in account with the
United States Appropriation.*

1889.				Dr.
	To receipts from the Treasurer of the United States, per appropriation for the year ending June 30, 1889, under act of Congress, approved March 2, 1887.....			
				\$15,000 00
1889.	CREDITS.	LED. PAGE.	CR.	
June 30.	By salaries.....	204	\$6,285 00	
"	labor.....	215	1,970 28	
"	supplies.....	229	1,219 96	
"	freight and expressage	240	404 64	
"	postage and stationery	244	353 54	
"	printing.....	248	855 52	
"	library.....	252	246 49	
"	tools and implements..	256	310 57	
"	scientific instruments..	262	122 73	
"	chemical apparatus and supplies.....	266	78 40	
"	furniture.....	272	145 46	
"	general fittings and fixtures.....	274	493 07	
"	fencing and drainage..	283	176 47	
"	live stock.....	286	15 00	
"	travelling.....	288	528 55	
"	incidental expenses...	292	40 00	
"	laboratory fittings...	294	810 03	
"	horticultural supplies..	296	279 26	
"	buildings and repairs..	277	663 58	
				\$14,998 65
June 30.	Balance unexpended.....			1 35
				\$15,000 00

AUDITOR'S CERTIFICATE.

We, the undersigned, duly appointed auditors for the corporation, do hereby certify that we have examined the books and accounts of the Experiment Station of the Maryland Agricultural College, for the fiscal year ending June 30, 1889; that we have found the same well kept and classified as above, and that the receipts for the year are shown to have been \$15,000.00 and the corresponding disbursements \$14,998.65, for all of which proper vouchers are on file and have been by us examined and found correct—thus leaving an unexpended balance of \$1.35 to be hereafter accounted for.

(Signed)

ALLEN DODGE,

(Signed)

CHAS. A. WELLS,

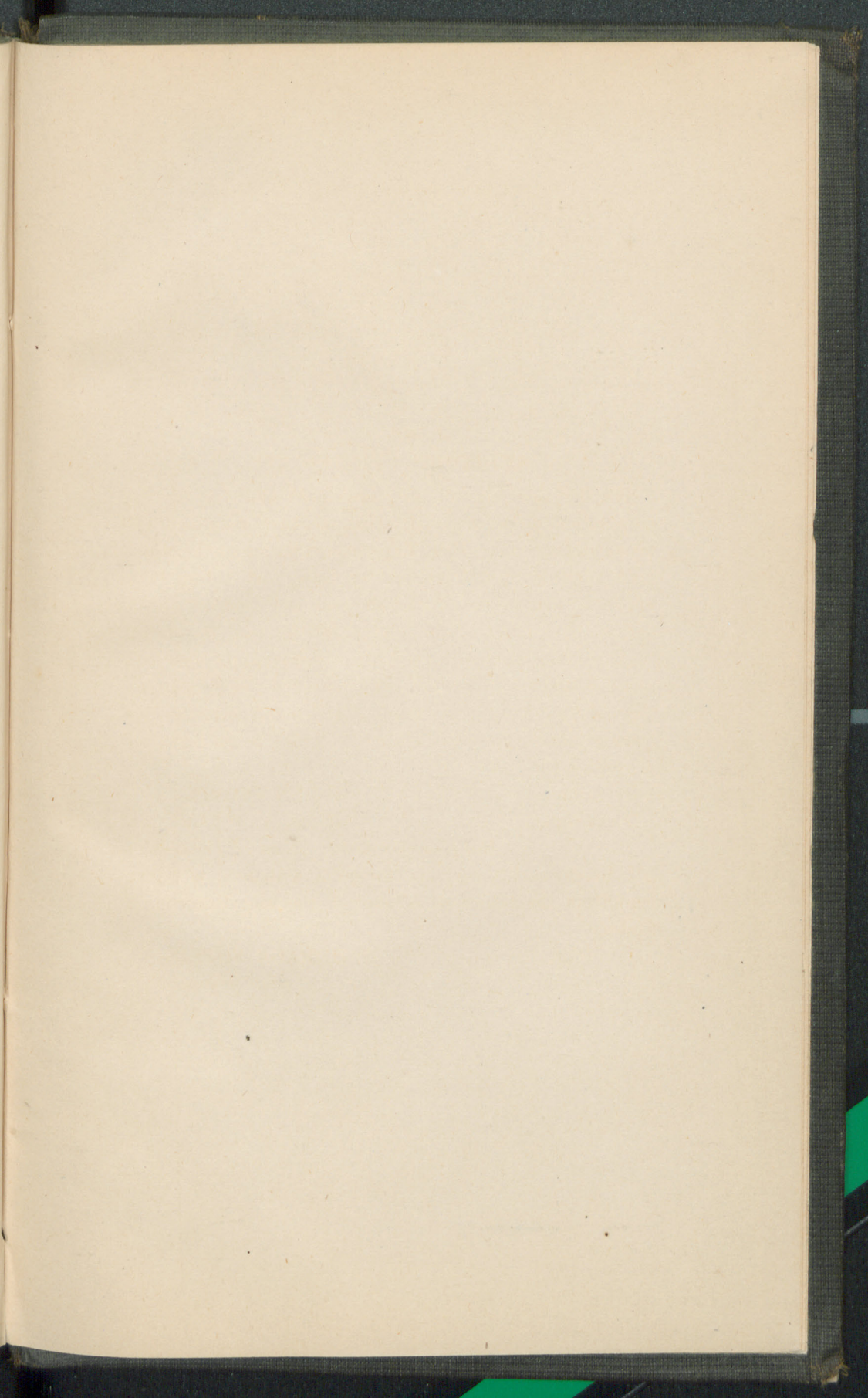
Auditing Committee, Board of Trustees.

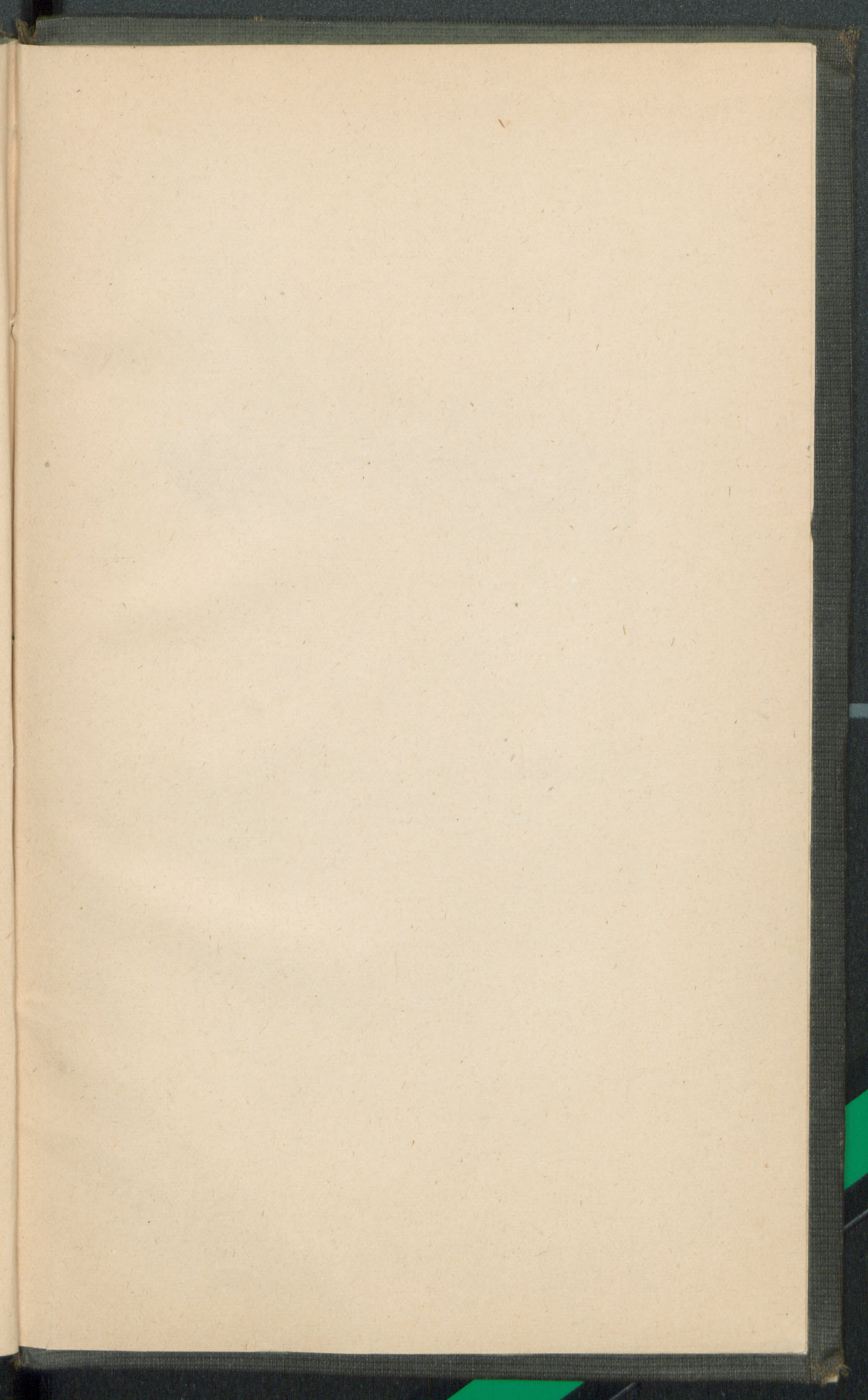
I hereby certify that the foregoing statement is a true copy from the books of account of the said Experiment Station.

(Signed)

W. HORACE SOPER,

Treasurer.





378.73 Return this book on or before the last
M36C date stamped below

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1888-89

OC 21 '34

